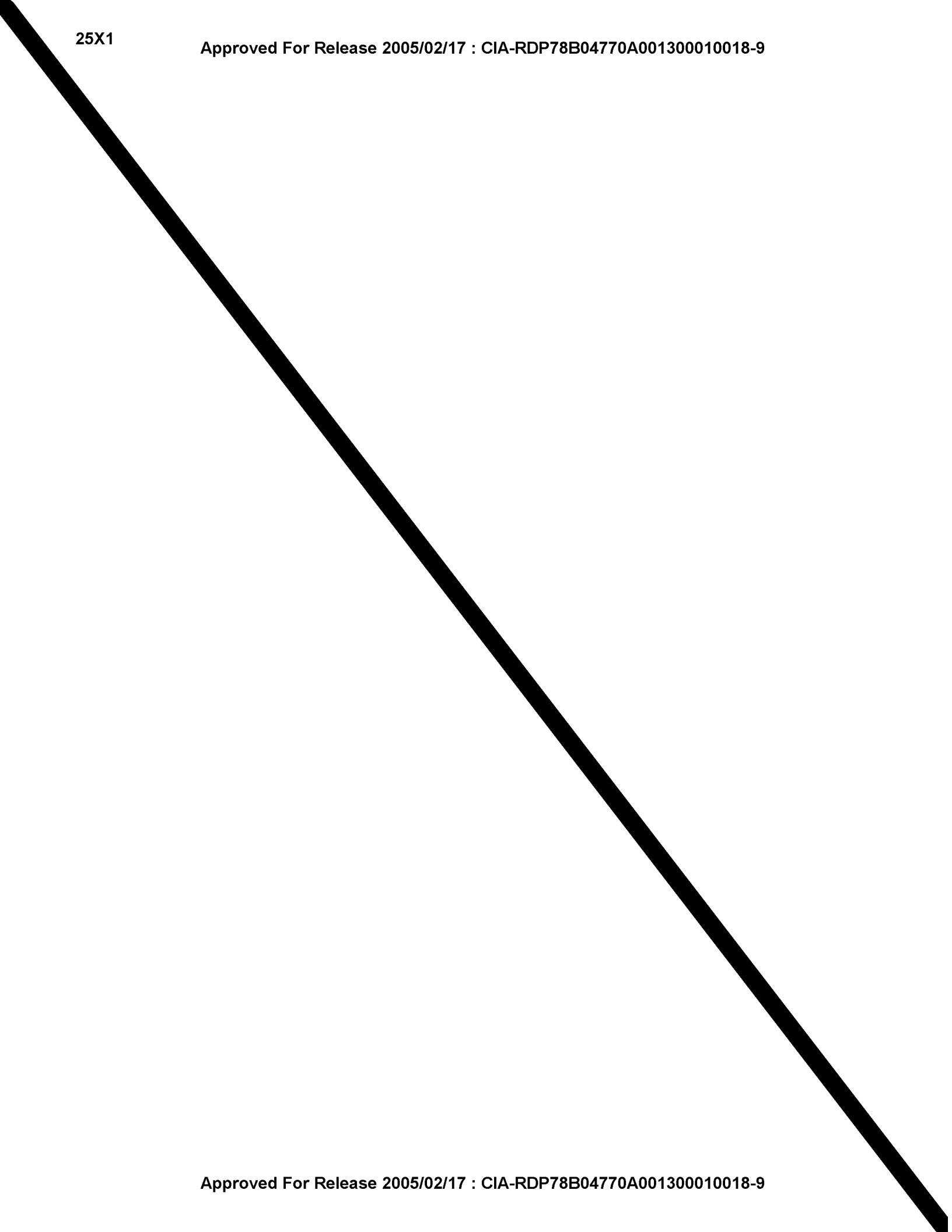

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PAR 255A

Preparation of Simulations of
High-Altitude Aerial Photography

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3 April 1970

REVISION BACKGROUND

On 26 March, a meeting was held with the customer to discuss a revision to PAR 255. The task was expanded and agreement was reached on the technical content and scope of the work. The changes agreed upon are reflected in PAR 255A. The number of original scenes has been increased from one to five and the number of scales to be simulated has been increased to six. System MTF will be simulated if possible.

The schedule for delivery of simulations has been increased from six to eight weeks after receipt of originals from the customer.

In the text of this revision *italic* type was used to indicate the points at which PAR 255 was changed.

PROJECT AUTHORIZATION REQUEST

PAR 255A
3 Apr 70

SUBJECT: Preparation of Simulations of High-Altitude Aerial Photography

TASK/PROBLEM

1. Prepare simulated black-and-white aerial negatives and dupes from original photography provided by the customer. Simulations shall depict *high-altitude photography with ground resolution of 2, 4, 7, 16, 28 and 48 inches.*

PROPOSAL

2. Introduction. It is proposed that the contractor furnish simulations in accordance with customer requirements described herein. This contractor has demonstrated the capability of producing negatives which simulate high-altitude aerial photography in which tone reproduction, limiting resolution, and modulation transfer functions can be controlled in negatives of various scales on any aerial negative product.

3. Background. On 3 February 1970, two customer representatives met with the contractor to discuss simulation requirements. *A second meeting was held on 26 March to firm up the requirements of the task. The customer requires duplicate positives from negatives on Type 3404 film having ground resolution of 2, 4, 7, 16, 28 and 48 inches. The negatives would be made from 5 low-altitude photographs supplied by the customer.* The contractor described the procedure for preparing simulations and their limitations. Agreement was reached that simulations meeting the customer's requirements could be produced by the contractor.

4. Approach:

a. For this effort the customer will supply the following:

(1) Five original negatives on Type 3404 film at about 2000:1 scale showing ground resolution of about 1.5 inches.

(2) Sensitometric data relative to the negative.

(3) Ground truth data and target calibration data relative to the photograph.

(4) Flight data.

(5) Frames adjacent to the preferred scene which contain images of the ground targets.

b. The contractor will produce negatives from the original *negatives* using laboratory cameras to simulate high-altitude photography of the scene. Tone reproduction will be controlled to represent nominal haze conditions. *Image quality will be controlled to demonstrate limiting ground resolution, scale, typical limiting film resolution and, when possible, system MTF. There are no limitations on the final image size. The scales in the negatives, and thus the image size, will vary by a factor of 31.2. Degradation of imagery to obtain the correct ground resolution (film resolution) will be accomplished by modifying the lens pupil function when making the reduced negatives.*

OBJECTIVES

5. The contractor will prepare and deliver one simulated aerial negative of the *5 different scenes* on Type 3404 film having the characteristics listed below:

Negative No.	*Scale Factor**	Ground Resolution (Inches)
1	*6*	*2*
2	*12*	*4*
3	*30*	*7*
4	*54*	*16*
5	*110*	*28*
6	*188*	*48*

* *The exact scale values will be specified by the customer.*

6. The contractor will also furnish three contact positive transparencies on 2430 film from each negative. The positives will be sandwiched in clear plastic with an opaque mask outside the image area.

7. A final report will be submitted that describes in detail the procedure followed in preparing the simulations and the characteristics of each image.

SCHEDULE

8. *All simulations (images) will be delivered to the customer within 8 weeks (40 working days) of receipt of all the original negatives and other necessary information from the customer.* Data describing the simulation characteristics will be delivered with the images. *The final report will be submitted within one week after delivery of the images.* A tentative schedule covering the major phases of effort is shown in Figure 1.

TENTATIVE SCHEDULE

Preparation of Simulations of
High-Altitude Aerial Photography

PAR 255A

3 Apr 70

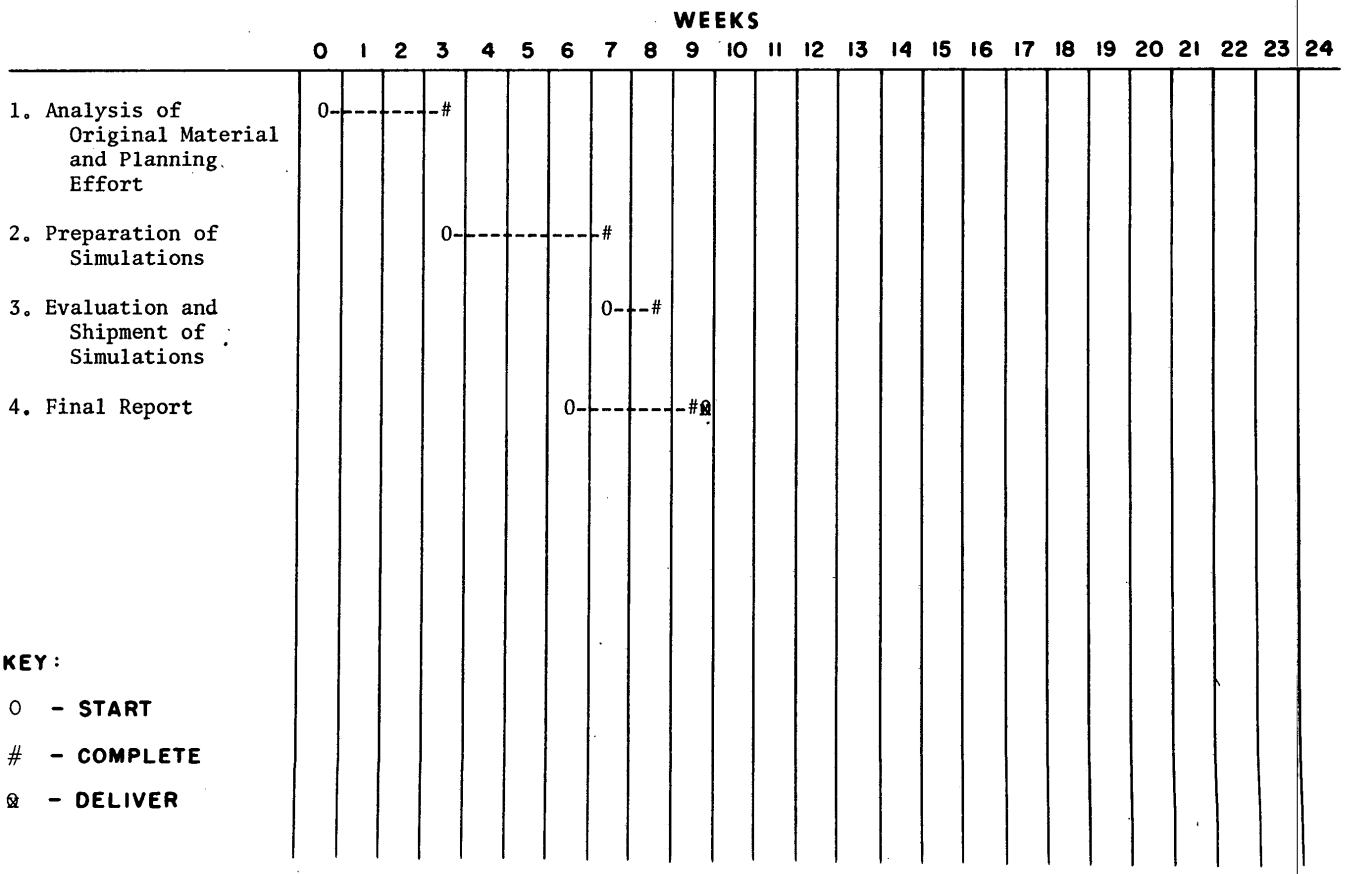

Figure 1